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Agricultural Biotechnology Annual

Kenya Biotechnology Update Report

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Report Highlights:
With the signing of the biosafety regulations by the Government of Kenya (GOK), Kenyan scientists are ready to move ahead to the next level, with Bt cotton commercialization envisioned by 2014. Although the three (out of a possible eight) signed biosafety regulations deal with placing Genetically Modified Organisms (GMO) on the market, contained use, and import/export and transit, it remains unclear how Kenyan authorities will handle trade of agricultural biotechnology products. It is hoped that the signed biosafety regulations will be published soon. Reportedly, the GOK plans to draft labeling regulations.

Section I. Executive Summary

In addition to the formation of the National Biosafety Authority (NBA) in May 2010, the GOK published the commencement of the "Biosafety Act 2009" on July 1, 2011 and signed three sets of biosafety regulations, paving way for possible commercialization of biotechnology crops within the next three years. It is hoped that the biosafety regulations will be published soon. While Kenyan scientists appreciate the efforts by the government, it is too early to comment on how the three biosafety regulations, namely application for contained use, environmental release, and import/export will be implemented. Reportedly, Kenyan regulators are considering drafting labeling regulations that will require all biotechnology products be labeled. Presently, the GOK requires labeling on all GMO plant products. In addition, the GOK agencies responsible for labeling of food and non-food materials may view GMO labeling in the same manner. Kenya's intended labeling regulation may change as Kenya develops its own GMO products (i.e. Bt cotton and Bt maize) and realizes that they are scientifically the same with the non GMO products.

As a result of the 2011 drought and high food prices, the GOK allowed importation of duty-free maize, including genetically modified (GM) maize to help alleviate the current food shortage in the country. However for fear of possible propagation, only registered millers with written approval from NBA (the GOK agency responsible for the implementation of the Biosafety Act) are allowed to import GM maize. So far no registered miller has indicated GM maize importation interests, largely due to the ongoing debate that has instilled fear among the Kenyan consumers. The prevailing food shortage brought GM issues to focus leading to a lot of debate for and against the technology. Amidst the debate on biotechnology, Kenyan biotechnology scientists, some regulatory institutions, and farmer organizations have added their voices on the importance of adopting the technology. The recurrent debate on GMO has resurfaced the need for more education on biotechnology, and its benefits and misinformation.

In the report here below, FAS/Nairobi has updated, to a greater or lesser degree, all of the Sections of the 2010 report.

Section II. Plant Biotechnology Trade and Production

With the new biosafety regulations, all GMO products imported into Kenya require written approval from NBA. The new agriculture biotechnology regulations address import and transit of GMO products. The GOK also requires labeling and reportedly NBA is in the process of drafting labeling requirements. At the moment it remains unclear how Kenyan authorities will address trade in biotechnology events.

The Kenya Agricultural Research Institute (KARI) provided the information for the following table (it may not capture all of the trials currently being conducted in Kenya). While some of the table entries may involve gene modification using modern agriculture biotechnology, others may be using more "traditional" methods including tissue culture and hybridization.

Crop	**Year Trials Began**	**Current Status**	**Collaborators**
Bio Cassava Plus. Beta	2003	Confined	KARI, and Danforth Center (USA)

carotene enhancement gene		Field Trial (CFT)	
Improved Maize for African Soils (IMAS). Developing transgenic nitrogen- use-efficient maize	2010	CFT planned in 1 to 2 years time	KARI and Pioneer
Disease resistant banana	March 2011	Lab and green house research	International Livestock Research Institute (ILRI)
Genetic modification for yam for nematode resistance	March 2011	Lab and green house research	ILRI
Insect resistance Pigeon Pea	March 2011	Lab and green house research	Kenya University
Insect resistant sweet potato	April 2010	Lab and green house research	Kenyatta University
Insect-resistant corn	2001 leaves 2003 seeds	CFT	KARI, CIMMYT, Syngenta Foundation, Rockefeller Foundation and Monsanto
Insect-resistant Cotton	2003	CFT	KARI, and Monsanto
Virus-resistant cassava (Virus Resistant Cassava for Africa (VIRCA))	2003	CFT	KARI, Danforth Center (USA), and USAID/ABSP 11
Africa Biofortified sorghum	2005 & 2009	CFT	Africa Harvest, Pioneer, KARI, and AATF
Water efficient, drought-resistant corn. Water Efficient Maize for Africa (WEMA)	2008	CFT	AATF, CIMMYT, Monsanto and National agricultural research systems in Kenya. Funding provided by the Bill & Melinda Gates and the Howard G. Buffett foundations
Virus-resistant sweet potato	1998	CFT	KARI, Monsanto, USAID, ARC-VOPI (South Africa), and Danforth Center (USA)

Reportedly, the Virus resistant sweet potato project will be discontinued due to lack of funding and progress.

Section III. Plant Biotechnology Policy

The NBA is now the government agency responsible for the implementation of the biosafety Act, as well as International biotechnology agreements such as the Cartagena Protocol. The National Council for Science and Technology established the NBA to develop agricultural biotechnology policies and review applications to begin field trials and eventually commercialization. Participation on the NBA includes representatives from Government Ministries, as well as scientists from civil society and the national universities.

GOK ministries and roles on the NBA include the Kenya Plant Health Inspectorate Service, Ministry of Agriculture, which oversees the introduction, testing and use of biotechnology plants and seeds; the Ministry of Health and the Kenya Bureau of Standards, which regulate food safety; and the Ministry of Environment and Natural Resources, which oversees environmental questions and conducts environmental impact assessments among others.

Section IV. Plant Biotechnology Marketing Issues

In studies done in 2003, 2006 and 2007 by the International Maize and Wheat Improvement Centre (CIMMYT), KARI and Kansas State University, Kenyan consumers were found to accept agricultural biotechnology and genetic modification of foods at rates well below 50 percent (please see table below). Processors and retailers showed a higher level of acceptance, especially with regard to genetically modified foods.

Biotechnology Awareness in Kenya

Type	**Area or Industry**	**Number** surveyed	**Awareness**	
			Biotechnology Percentage (%)	**GM* crops**
Urban consumers	Nairobi	612	46	38
Rural consumers	Western Kenya	121	16	13
	Eastern Kenya	400	63	31
Gatekeepers	Milling companies	32	67	87
	Supermarkets	40	83	79

Source: CIMMYT *GM – Genetically Modified

In an attempt to improve the knowledge and acceptance of biotechnology and GMO crops and foods, the GOK, with support from USAID and other donors, established a National Biotechnology Awareness Creation Strategy (BioAware-Kenya).

How the vast majority of small-scale Kenyan farmers will react to the opportunity to buy and plant biotechnology seeds remains an open question. From present-day experience, it is clear that Kenyan farmers have not fully exploited all of the currently-available, production-enhancing technologies. Some of the simplest and most cost-effective strategies, including soil testing to determine the correct volumes of commercial fertilizer applications necessary to maximize crop yields, are not employed by the vast majority of Kenyan small-scale farmers.

A new approach to agriculture policy that includes capacity and confidence building, policy stability in form and application from year-to-year and production and trade enhancing characteristics will be needed in Kenya before the full benefits of agriculture biotechnology can be realized. Poor policies mean farmers minimize their investment in agriculture, because of their inability to predict/expect profits from efforts.

Section V. Plant Biotechnology Capacity Building and Outreach

The following list represents U.S. Government funded biotechnology capacity building and outreach activity:

1. Fellowship programs in agriculture biotechnology, intellectual property rights, technology transfer, and policy development;
2. Farmer-to-farmer capacity building workshops;
3. Biotechnology speaker programs;
4. Biotechnology public awareness and outreach; and,
5. Support to African biotechnology stakeholder organizations.

Additional capacity building will strengthen Kenyan biotechnology and GMO researchers, GOK regulatory officials and private sector resellers. Continued awareness building will likely help consumers understand the benefits of genetic engineering and biotechnology crops and foods.

Section VI. Animal Biotechnology

Kenya does not currently use, nor participate in, scientific studies that employ animal genetic modification (AGM) or cloning. Reportedly, the Ministry of Livestock has not proposed AGM legislation or regulations and furthermore has not broached the topic with other Government regulators.